

CLAIMS

We claim:

1. A spreading system comprising:
 - 2 a first spreader configured and arranged to produce a first spread signal based on a first data signal;
 - 4 a second spreader configured and arranged to produce a second spread signal based on a second data signal;
 - 6 a filter configured and arranged to produce a filtered signal based on the first spread signal; and
 - 8 an adder configured and arranged to produce a digital sum signal based on the filtered signal and the second spread signal.
2. The spreading system according to claim 1, wherein the width of the
2 filtered signal is greater than one bit.
3. The spreading system according to claim 2, wherein the width of the
2 first spread signal is one bit.
4. The spreading system according to claim 1, wherein the first spreader
2 is configured and arranged to spread the first data signal with a first pseudonoise sequence, and
4 wherein the second spreader is configured and arranged to spread the second data signal with a second pseudonoise sequence, and

- 6 wherein the second pseudonoise sequence is different than the first
pseudonoise sequence.

5. The spreading system according to claim 4, wherein the width of the
2 filtered signal is greater than one bit, and

wherein the width of the first spread signal is one bit.

6. The spreading system according to claim 1, wherein the first spreader
2 includes an exclusive-or gate.

7. The spreading system according to claim 1, the spreading system
2 further comprising a gain element configured and arranged to produce a controlled
signal based on the second spread signal,
4 wherein the digital sum signal is based on the filtered signal and the controlled
signal.

8. The spreading system according to claim 7, wherein the gain element
2 includes a multiplier.

9. The spreading system according to claim 7, wherein the width of the
2 filtered signal is greater than one bit, and

wherein the width of the first spread signal is one bit.

2 10. The spreading system according to claim 1, the spreading system
 further comprising a gain element configured and arranged to produce a controlled
4 signal based on the filtered signal,

 wherein the digital sum signal is based on the controlled signal and the second
6 spread signal.

 11. The spreading system according to claim 10, wherein the gain element
2 includes a multiplier.

 12. The spreading system according to claim 1, the spreading system
2 further comprising a second filter configured and arranged to produce a second
 filtered signal based on the second spread signal,
4 wherein the digital sum signal is based on the filtered signal and the second
 filtered signal.

 13. The spreading system according to claim 12, wherein the width of the
2 filtered signal is greater than one bit, and

 wherein the width of the first spread signal is one bit.

 14. The spreading system according to claim 1, wherein the filter
2 comprises a lowpass filter having a cutoff frequency substantially equal to one-half of
 a bit rate of the first spread signal.

 15. The spreading system according to claim 1, further comprising:

- 2 a third spreader configured and arranged to produce a third spread signal based
on the first data signal;
- 4 a fourth spreader configured and arranged to produce a fourth spread signal
based on the second data signal; and
- 6 a second adder configured and arranged to produce a digital sum signal based
on the third and fourth spread signals.

16. The spreading system according to claim 15, wherein the width of the
2 filtered signal is greater than one bit, and
- wherein the width of the first spread signal is one bit.

17. The spreading system according to claim 15, wherein the fourth
2 spreader is configured and arranged to spread the second data signal with a first
pseudonoise sequence, and
- 4 wherein the third spreader is configured and arranged to spread the first data
signal with a second pseudonoise sequence, and
- 6 wherein the second pseudonoise sequence is different than the first
pseudonoise sequence.

18. The spreading system according to claim 17, wherein the first spreader
2 is configured and arranged to spread the first data signal with the first pseudonoise
sequence, and
- 4 wherein the second spreader is configured and arranged to spread the second
data signal with the second pseudonoise sequence.

19. The spreading system according to claim 18, wherein the width of the
2 filtered signal is greater than one bit, and

wherein the width of the first spread signal is one bit.

20. A method of digital signal processing, the method comprising:
2 spreading a first data signal to obtain a first spread signal;
spreading a second data signal to obtain a second spread signal;
4 filtering the first spread signal to obtain a filtered signal; and
adding a signal based on the filtered signal and a signal based on the second
6 spread signal to obtain a digital sum signal.

21. The method of digital signal processing according to claim 20, wherein
2 the spreading a first data signal includes spreading the first data signal with a first
pseudonoise sequence, and
4 wherein the spreading a second data signal includes spreading the second data
signal with a second pseudonoise sequence, and
6 wherein the second pseudonoise sequence is different than the first
pseudonoise sequence.

22. The method of digital signal processing according to claim 20, wherein
2 the width of the filtered signal is greater than one bit.

23. The method of digital signal processing according to claim 22, wherein
2 the width of the first spread signal is one bit.

24. The method of digital signal processing according to claim 20, wherein
- 2 the spreading a first data signal comprises performing an exclusive-OR operation
having the first data signal and a pseudonoise sequence as inputs and having the first
- 4 spread signal as an output.

25. The method of digital signal processing according to claim 20, the
- 2 method further comprising multiplying the filtered signal by a gain factor to obtain a
controlled signal,
- 4 wherein the adding a signal based on the filtered signal and a signal based on
the second spread signal includes adding a signal based on the controlled signal and a
- 6 signal based on the second spread signal.

26. The method of digital signal processing according to claim 20, the
- 2 method further comprising multiplying a signal based on the second spread signal by
a gain factor to obtain a controlled signal,
- 4 wherein the adding a signal based on the filtered signal and a signal based on
the second spread signal includes adding a signal based on the filtered signal and a
- 6 signal based on the controlled signal.

27. The method of digital signal processing according to claim 20, the
- 2 method further comprising:
- spreading the first data signal to obtain a third spread signal;
- 4 spreading the second data signal to obtain a fourth spread signal; and
- adding a signal based on the third spread signal and a signal based on the
- 6 fourth spread signal to obtain a second digital sum signal.

28. The method of digital signal processing according to claim 27, wherein
- 2 the spreading the first data signal to obtain a first spread signal includes spreading the first data signal with a first pseudonoise sequence, and
- 4 wherein the spreading a second data signal to obtain a second spread signal includes spreading the second data signal with a second pseudonoise sequence, and
- 6 wherein the spreading the first data signal to obtain a third spread signal includes spreading the first data signal with the second pseudonoise sequence, and
- 8 wherein the spreading the second data signal to obtain a fourth spread signal includes spreading the second data signal with the first pseudonoise sequence, and
- 10 wherein the second pseudonoise sequence is different than the first pseudonoise sequence.